HISTORICAL BACKGROUND of COLUMBIA RIVER TREATY

Uses of COLUMBIA RIVER in the 1800s

FISHIN
G

NAVIGATION

Later Uses of Columbia R.

- Fishing
- Navigation
- IRRIGATION (1890)

Later Uses of Columbia R.

- Fishing
- Navigation
- Irrigation (1890)
- HYDROPOWER (1900)

Later Uses of Columbia R.

- Fishing
- Navigation
- Irrigation (1890)
- Hydropower (1900)
- FLOOD CONTROL (1948)

Later Uses of Columbia R.

- Fishing
- Navigation
- Irrigation (1890)
- Hydropower (1900)
- Flood Control (1948)
- RECREATION (1950s)

PROJECT OWNERS

- U.S. Government
  - Corps of Engineers
  - Bureau of Reclamation
- Local Government Agencies
- Private Power Companies
- Local Flood Control Districts
- BC Hydro (Canada)

3 Stages of Development

1. Run-of-River Dam Stage
2. U.S. Storage Reservoir Stage
3. Columbia River Treaty Stage

In 1927

The U.S. Congress directed the Corps of Engineers to develop a plan for the Columbia River

COLUMBIA
RIVER
BASIN
1928-32 Corps
Study
Canada
U.S.
Kootenay R.
Clark Fork-Pend Oreille R.
Columbia R.
Seattle
MT
Clearwater R.
WA
Portland
Salmon River
ID
Willamette R.
OR
Snake R.
CA
NV

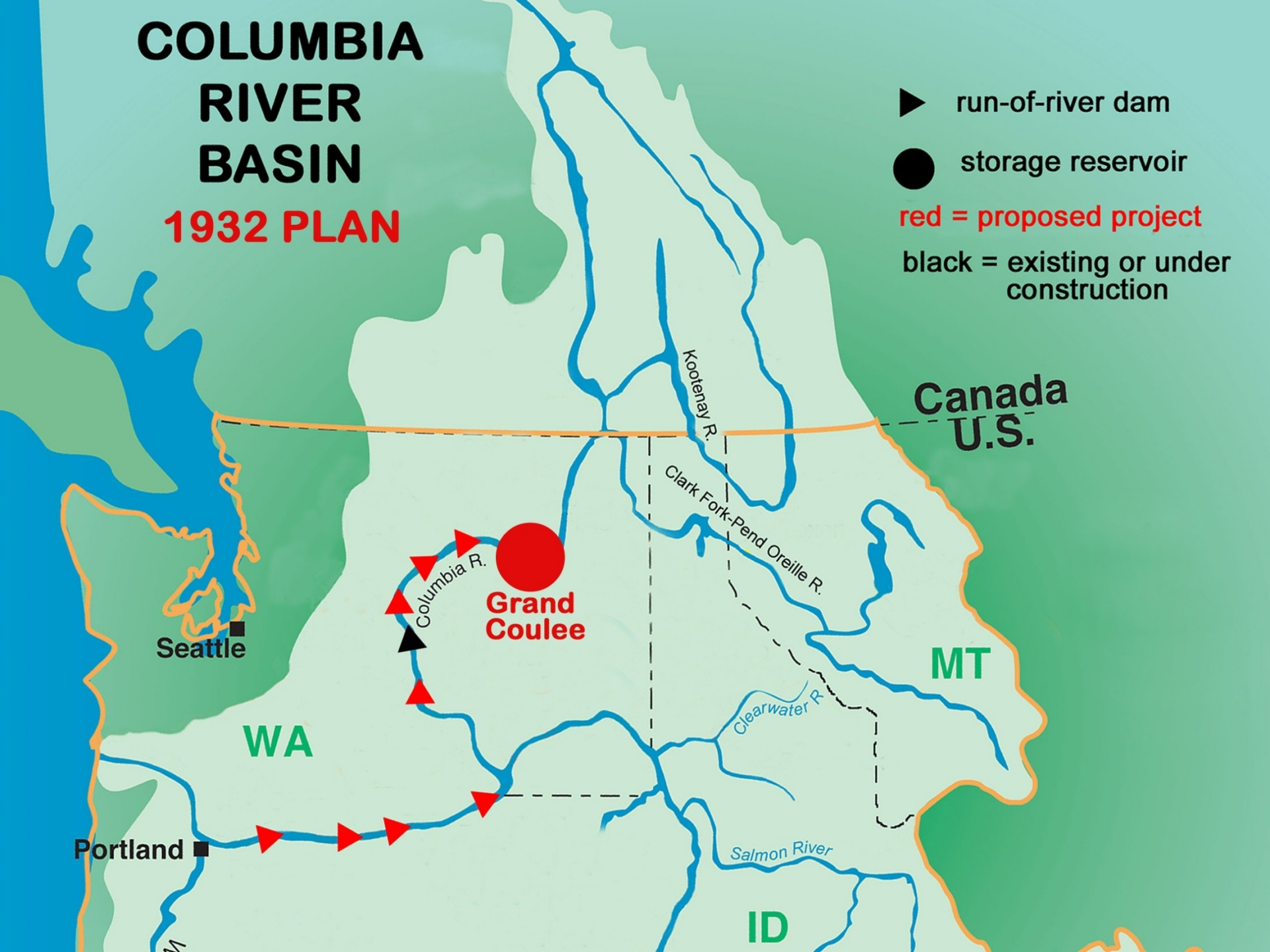
Purposes to be Considered

- HYDROELECTRIC POWER
- Navigation
- Irrigation
- Flood Control

Corps of Engineers 1932 Plan

- Grand Coulee reservoir
- 9 Run-of-river dams
- Navigation locks at 4 dams
- Flood control by levees

Levees to Prevent Flooding


COLUMBIA
RIVER
BASIN
1932 PLAN
run-of-river dam
storage reservoir
red = proposed project
black = existing or under construction
Canada
U.S.
Kootenay R.
Clark Fork-Pend Oreille R.
Columbia R.
Grand
Coulee
Seattle
Portland
WA
MT
ID
Clearwater R.
Salmon River

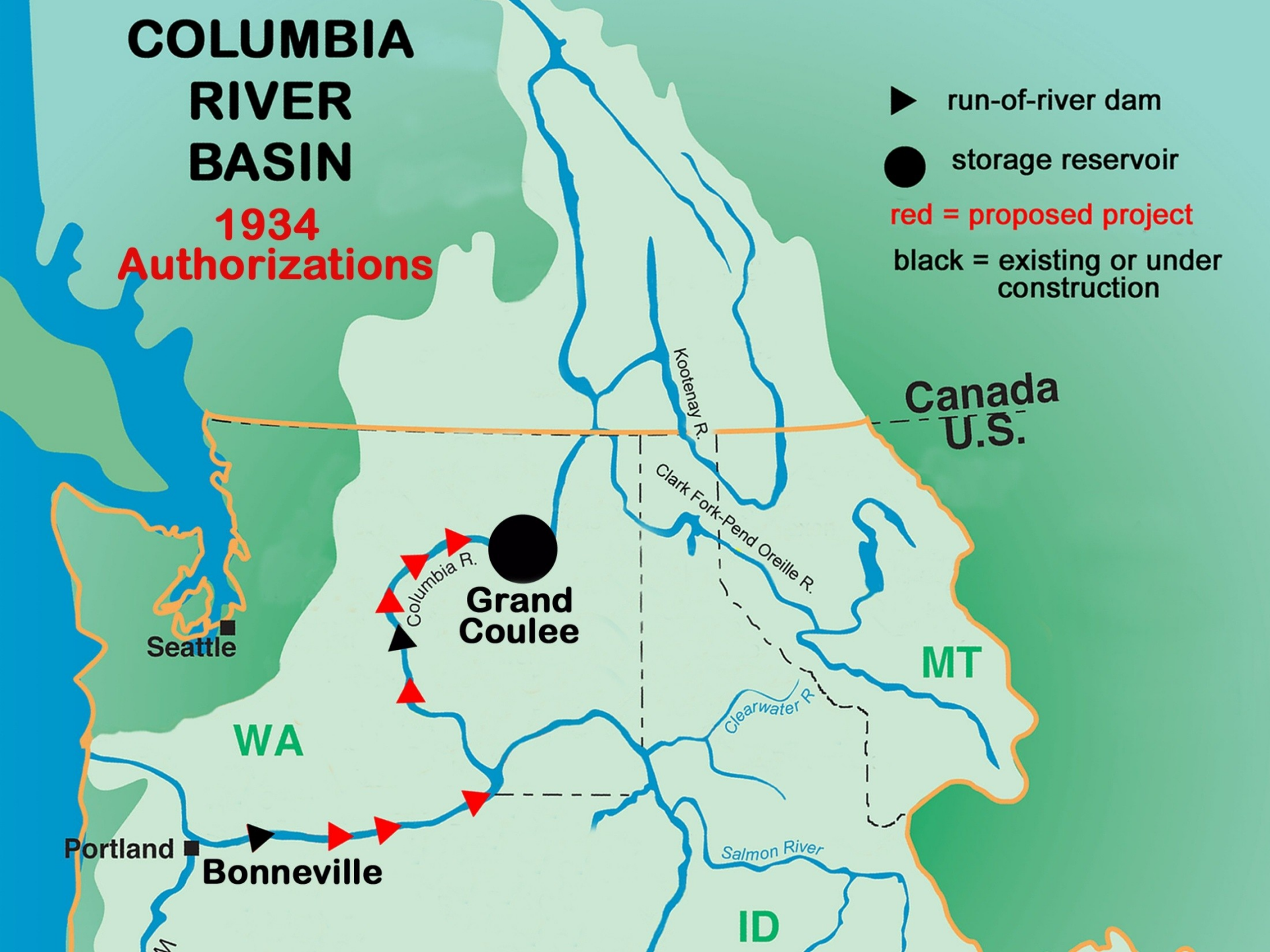
Two Projects Constructed 1934-40

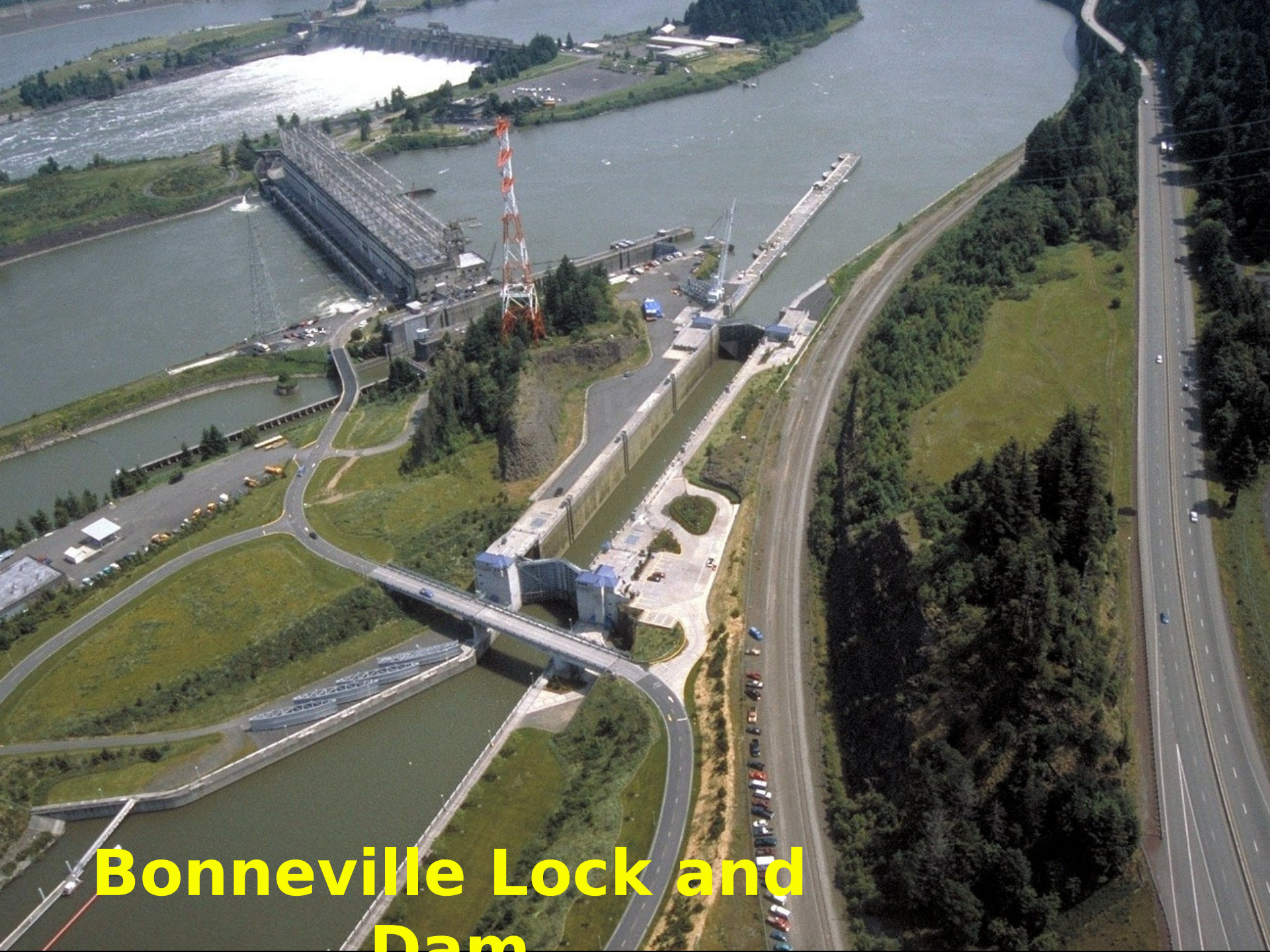
BONNEVILLE DAM

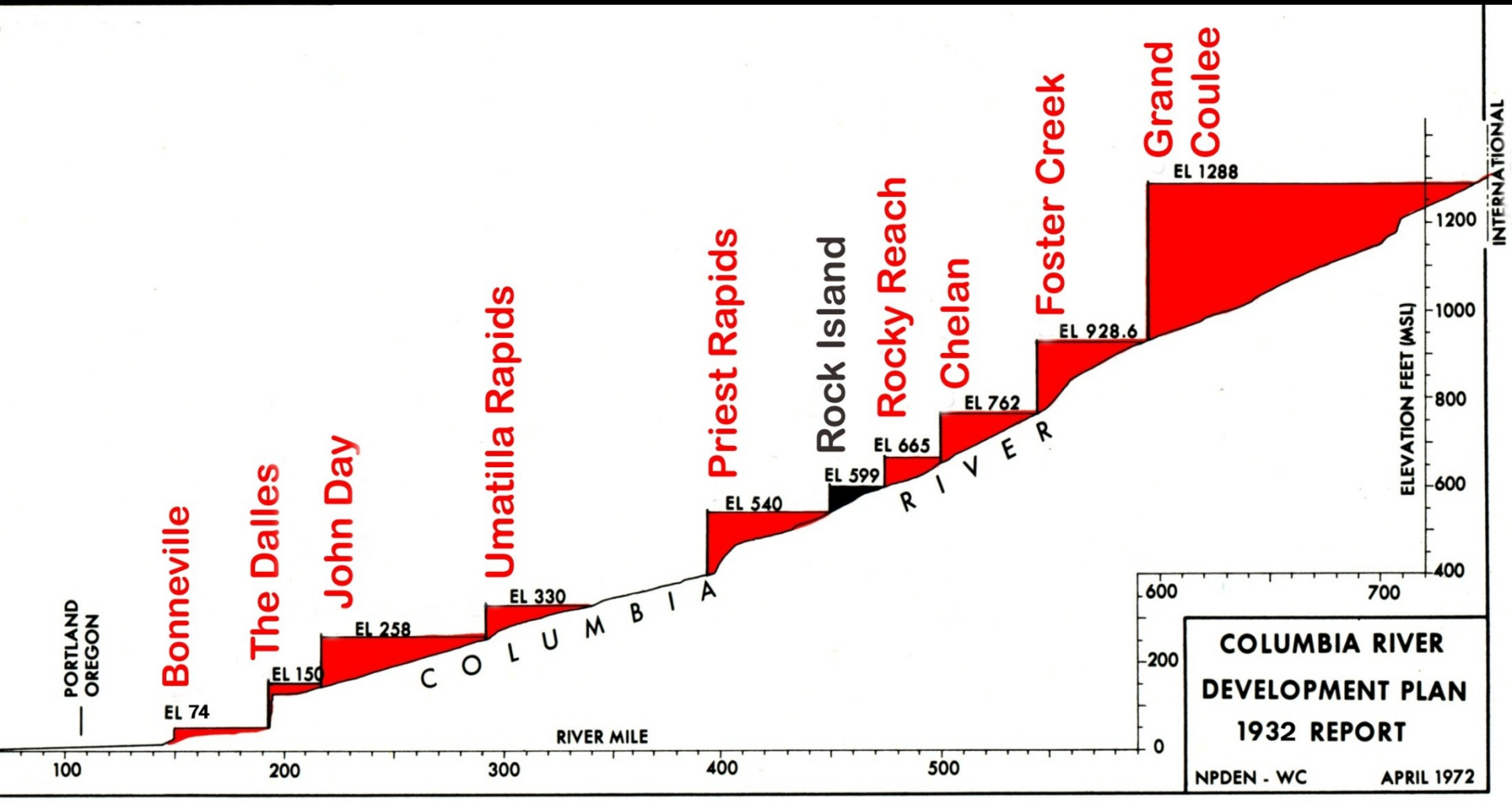
- run-of-river dam with lock
- power and navigation

GRAND COULEE DAM

- 6.3 km^3 (5.1 MAF) reservoir
- power and irrigation


COLUMBIA
RIVER
BASIN
1934
Authorizations
run-of-river dam
storage reservoir
red = proposed project
black = existing or under construction
Canada
U.S.
Kootenay R.
Clark Fork-Pend Oreille R.
Columbia R.
Grand
Coulee
Seattle
MT
WA
Clearwater R.
Portland
Bonneville
Salmon River
ID


Bonneville Lock and Dam


PORTLAND
OREGON
Bonneville
EL 74
The Dalles
EL 150
John Day
EL 258
Umatilla Rapids
EL 330
Priest Rapids
EL 540
Rock Island
EL 599
Rocky Reach
EL 665
Chelan
EL 762
Foster Creek
EL 928.6
Grand Coulee
EL 1288
COLUMBIA RIVER
INTERNATIONAL
RIVER MILE
100
200
300
400
500
600
700
ELEVATION FEET (MSL)
1200
1000
800
600
400
200
0
COLUMBIA RIVER
DEVELOPMENT PLAN
1932 REPORT
NPDEN - WC
APRIL 1972

1937: Bonneville Power Administration (BPA) created

- To sell the power from U.S. Government hydro projects
- To build transmission lines
- To dispatch power from Government hydro projects

3 Stages of Development

1. Run-of-River Dam Stage
2. U.S. Storage Reservoir Stage
3. Columbia River Treaty Stage

Columbia River is a “Snowmelt” Stream

- Maximum streamflow is in the spring and summer
- Minimum streamflow in fall and winter
- Maximum electric power demand is in winter

Reservoir storage is needed

To develop the full power of the Columbia River hydroelectric projects

In 1943 Corps of Engineers was directed to study reservoir storage in Columbia River Basin

- Emphasis on storage for hydroelectric power
- Entire basin to be studied
- Complete the study by 1948

Canada invited to participate in the study

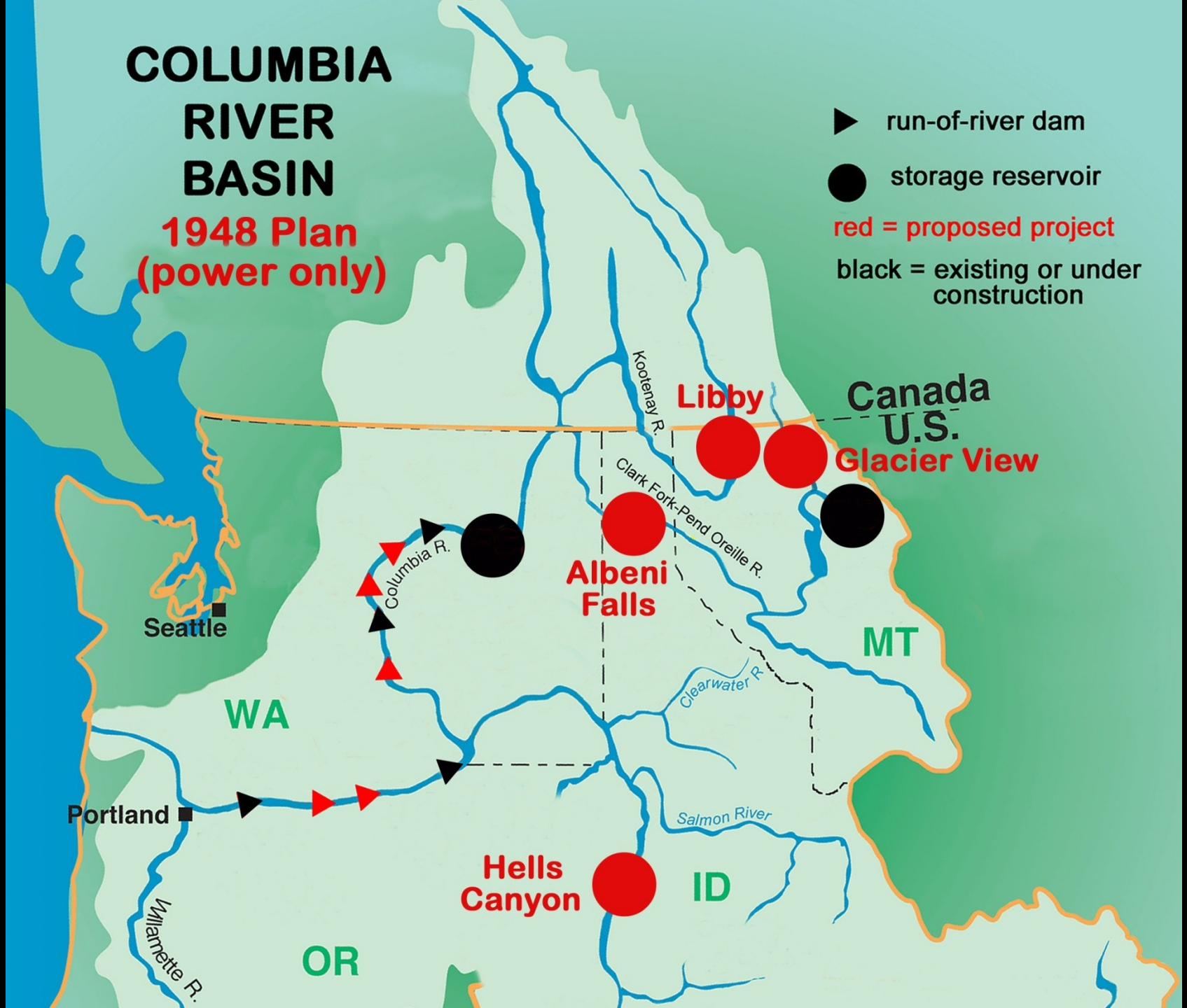
Canada was not able to participate at that time

U.S. developed a plan with storage reservoirs in the U.S. only

The two countries also agreed to study future opportunities for cooperative development of the Columbia River basin

The 1943-1948 Corps of Engineers Columbia R. Reservoir Study

- Main objective was reservoir storage for hydroelectric power
- Flood control was not in the original reservoir plan

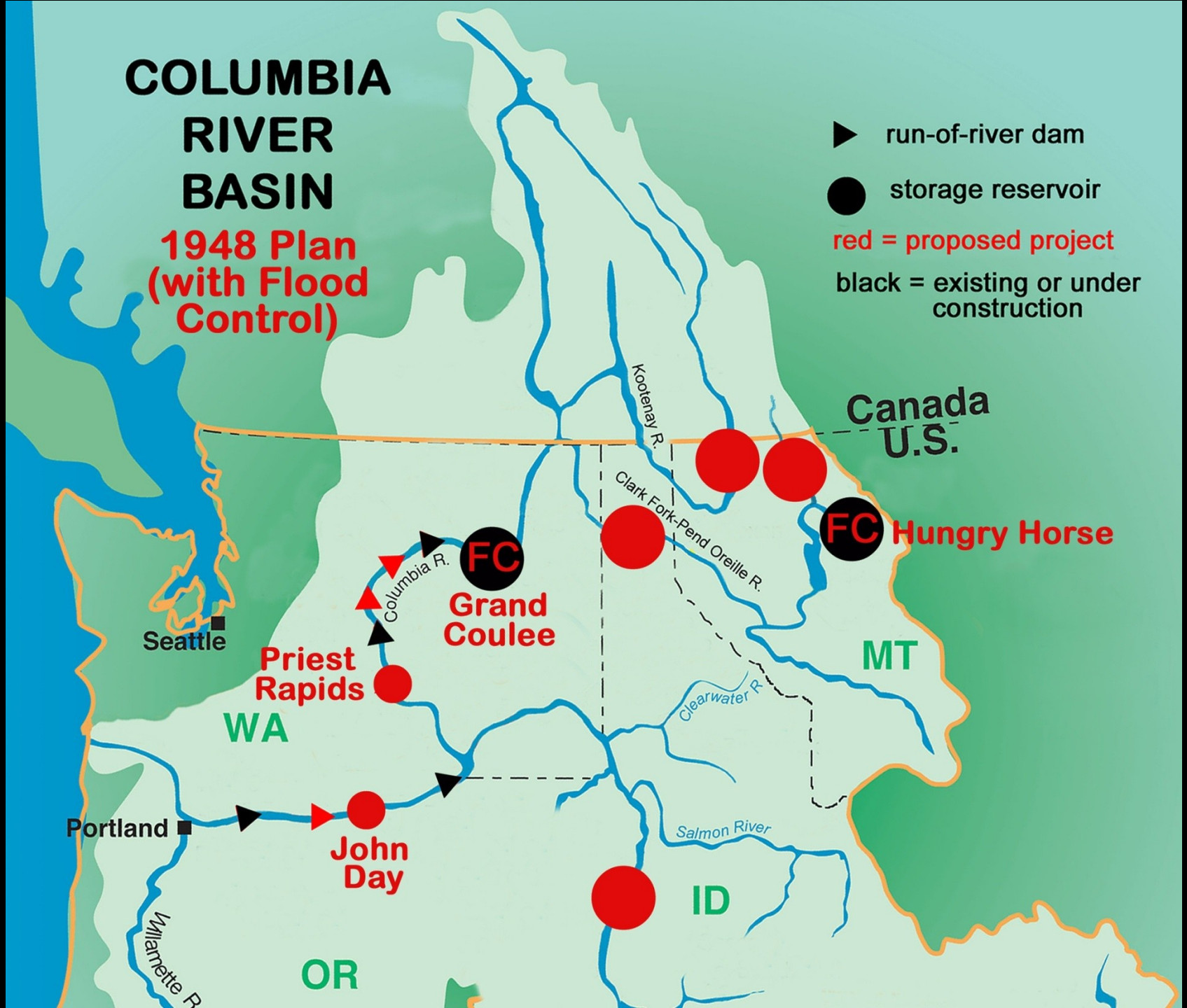

COLUMBIA
RIVER
BASIN
1948 Plan
(power only)
run-of-river dam
storage reservoir
red = proposed project
black = existing or under construction
Kootenay R.
Libby
Canada
U.S.
Glacier View
Clark Fork-Pend Oreille R.
Columbia R.
Albeni
Falls
Seattle
MT
WA
Clearwater R.
Portland
Salmon River
Hells
Canyon
ID
Willamette R.
OR

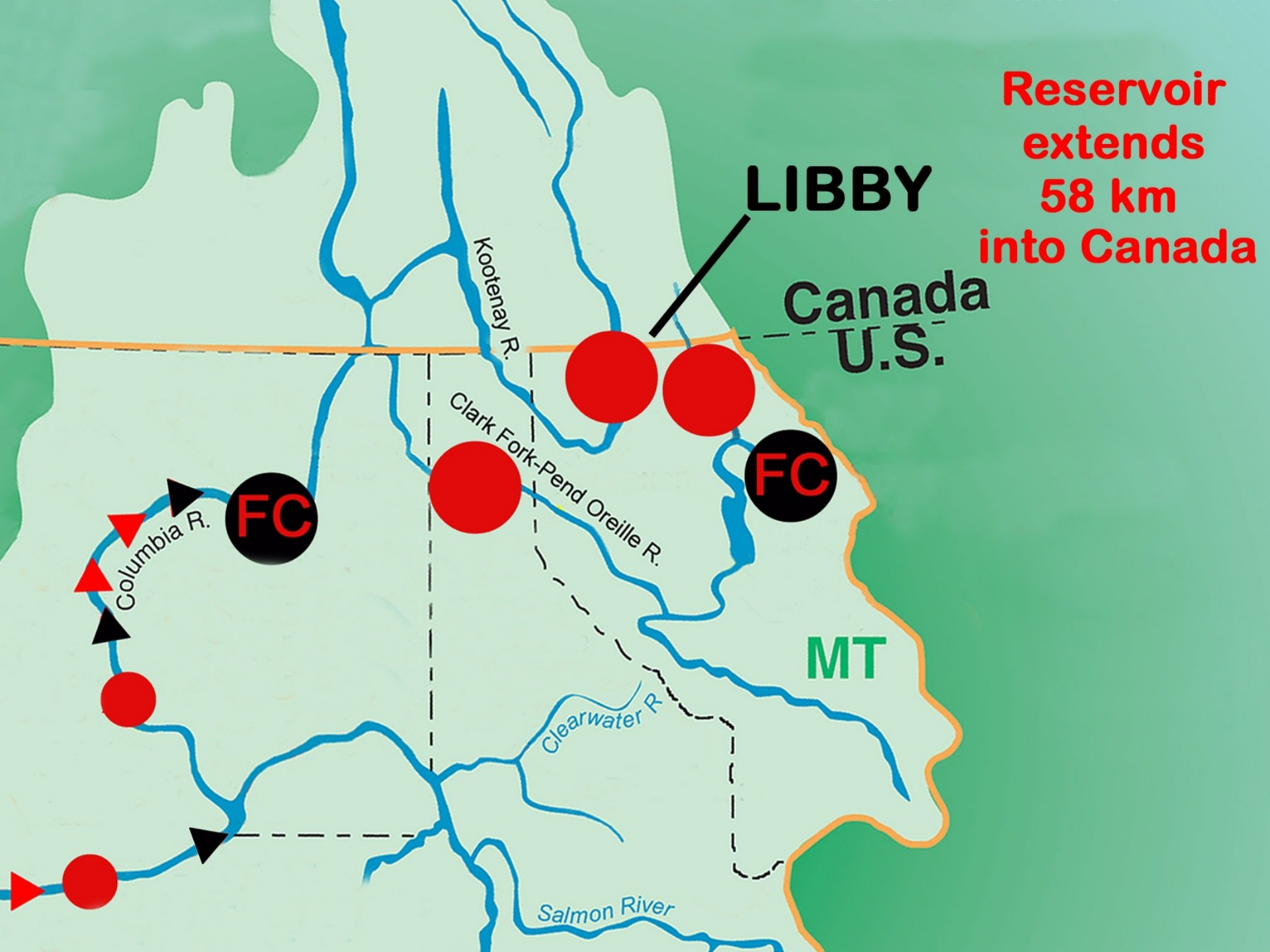
During the high water of May 1948 …

THE LEVEES FAILED!

Causing terrible damage!

The Corps of Engineers was directed to revise their reservoir plan TO INCLUDE FLOOD CONTROL


COLUMBIA RIVER BASIN
1948 Plan (with Flood Control)
run-of-river dam
storage reservoir
red = proposed project
black = existing or under construction
Canada
U.S.
Kootenay R.
Clark Fork-Pend Oreille R.
FC
Hungry Horse
FC
Grand Coulee
Columbia R.
Seattle
Priest Rapids
WA
MT
Clearwater R.
Portland
John Day
Salmon River
ID
Willamette R.
OR


Reservoir
extends
58 km
into Canada
LIBBY
Canada
U.S.
Kootenay R.
Clark Fork-Pend Oreille R.
Columbia R.
FC
FC
MT
Clearwater R
Salmon River

In 1951 U.S. requested permission from Canada to build Libby

Canada did not object to U.S. building the Libby project

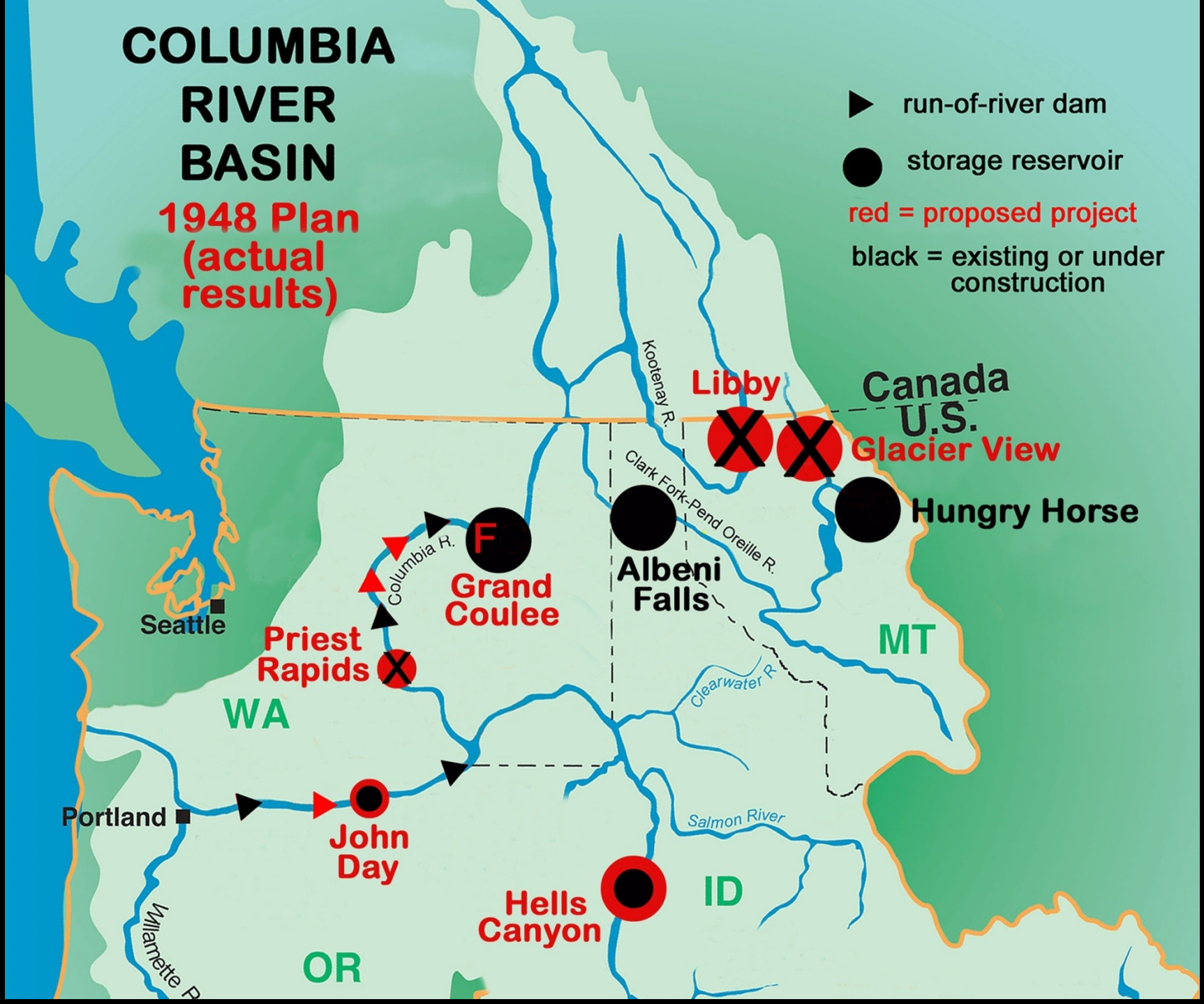
Canada objected to the compensation offered for the land flooded

U.S. offered to pay value of land flooded

Canada preferred a share of the downstream benefits

Because of the disagreement, planning for Libby reservoir stopped

Other reservoirs proposed in the Corps 1948 plan also had problems


COLUMBIA RIVER BASIN
1948 Plan (actual results)
run-of-river dam
storage reservoir
red = proposed project
black = existing or under construction
Libby
Canada
U.S.
Glacier View
Kootenay R.
Clark Fork-Pend Oreille R.
Hungry Horse
Albeni Falls
F
Grand Coulee
Columbia R.
Seattle
Priest Rapids
WA
MT
Clearwater R.
Portland
John Day
Salmon River
Hells Canyon
ID
OR
Willamette R.

The required flood control storage could not be provided

23.4 km³ (19.0 MAF) **required**

7.7 km³ (6.2 MAF) **would be available**

Activities 1952-1957

- Canada studied possible projects in Columbia R. basin in Canada (including diversions)
- U.S. studied building reservoir storage in U.S.
- The two countries continued studying cooperative development of Columbia R.

3 Stages of Development

1. Run-of-River Dam Stage
2. U.S. Storage Reservoir Stage
3. Columbia River Treaty Stage

1957-1959 Conclusions

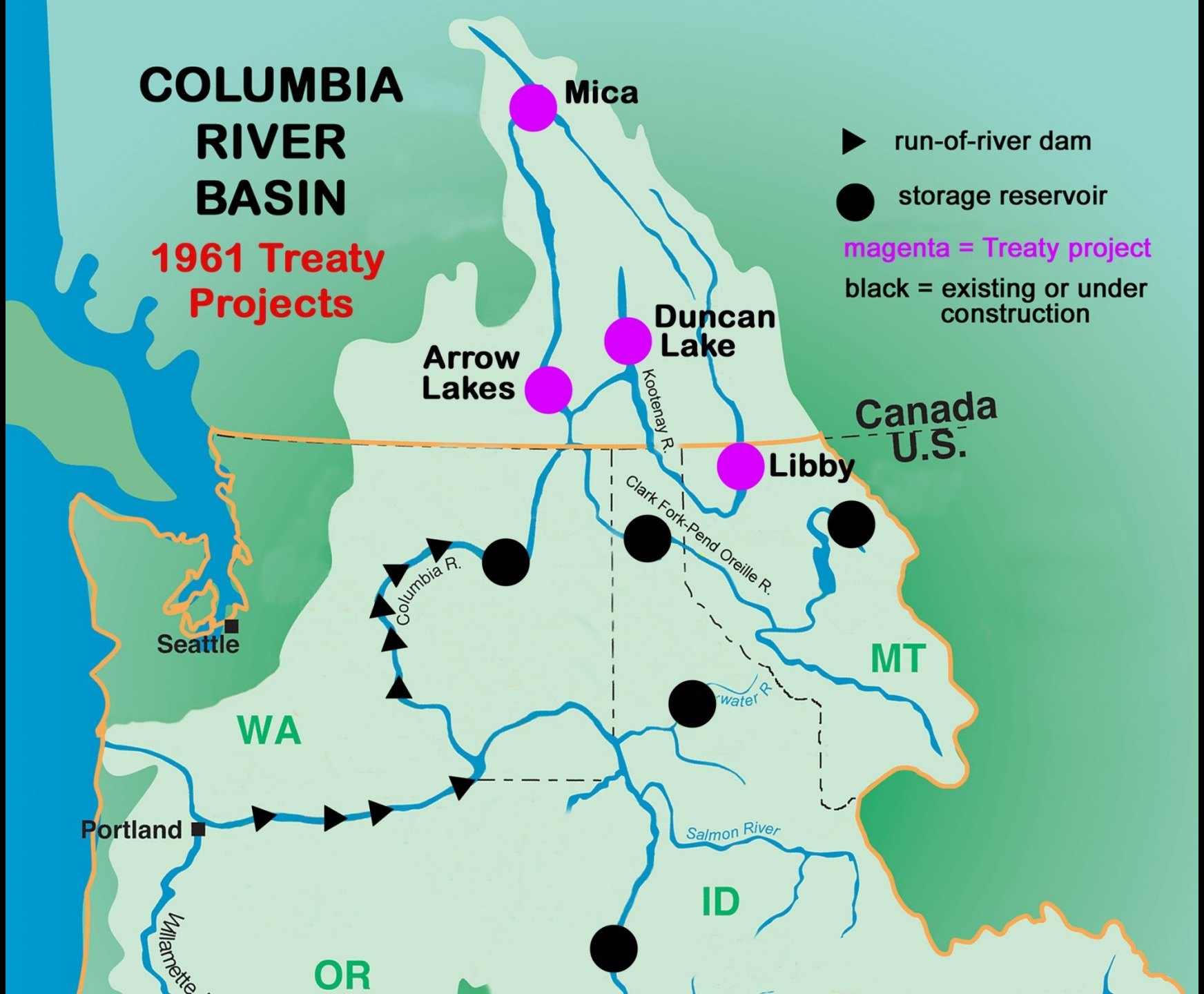
- Studies by both countries concluded that joint development was good
- Canada concluded plans should be made for entire basin, not just Libby
- U.S. agreed and also agreed to share downstream benefits

Columbia River Treaty Negotiated 1960-61

- **February 1960: U.S. and Canada began negotiations on Treaty**
- **January 1961: U.S. President Eisenhower and Canadian Prime Minister Diefenbaker signed the Columbia River Treaty**

COLUMBIA RIVER TREATY

- **Canada built 19.1 km³** (15.5 MAF) **of reservoir storage at Mica, Arrow Lakes, and Duncan Lake**
- **U.S. built Libby reservoir on Kootenai River**


COLUMBIA RIVER BASIN
1961 Treaty Projects
run-of-river dam
storage reservoir
magenta = Treaty project
black = existing or under construction
Mica
Duncan Lake
Arrow Lakes
Kootenay R.
Canada
U.S.
Libby
Clark Fork-Pend Oreille R.
Columbia R.
Seattle
MT
WA
Portland
Salmon River
ID
OR

COLUMBIA RIVER TREATY

- Reservoir storage regulated for power and flood control
- U.S. operates downstream projects to make best use of storage regulation
- The two countries share the downstream benefits equally

Ratification of Treaty

- U.S. Congress ratified Treaty in March, 1961
- Canadian Parliament delayed ratification until 1964

Reasons for Delay

Canada and British Columbia had to agree on

- **Who would build and operate the Treaty reservoirs (BC Hydro)**
- **How the Treaty reservoirs would be financed (sell power to U.S.)**

Reasons for Delay

U.S. and Canada had to agree on

- **Details for operating the Treaty Reservoirs**
- **How Canadian share of power benefits would be sold in U.S.**

1964 Ratification of Treaty

1. Jan. 1964: Protocol on operation of Treaty reservoirs
2. Jan. 1964: Agreement on sale of Canadian power benefits in U.S.
3. May 1964: U.S. power companies purchased Canadian power benefits
4. Sep. 1964: Pacific Northwest Coordination Agreement
5. Sep. 1964: Treaty became official

TREATY RESERVOIRS

Duncan Lake	1.7	km^3	1967
Arrow Lakes	8.8	km^3	1968
Mica	8.6	km^3	1973
Libby	6.1	km^3	1973

Financing the Canadian Reservoirs

- U.S. government paid Canada for half of the downstream flood control benefits for 60 years
- U.S. power companies purchased the Canadian half of the power benefits for 30 years

Questions
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